Insights into Physics:

MC900331702[1]

Motion

Unit 1



Physics:

In order to describe motion you must state the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the object is moving and \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ the object is moving. You should also tell the \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_

Frame of Reference, what is it, and how do you choose?

Relative motion:

Example:

|  |  |
| --- | --- |
| Distance | Displacement |
| Definition: | Definition: |

Vectors:

Displacement in a straight line:

You walk 3.5 miles north to your friend’s house, and then you both continue and walk an additional 2 miles to the movie theater. What is your total distance and displacement?

You drive your car 75 km west, and then drive back 35 km east. What is your total distance? What is your total displacement?

Displacement, that is not in a straight line:

Resultant Vector:

To get to school one student must walk 1 mile south and then 1.5 miles east. What is her total distance and total displacement?

Rob rides his bike 7 straight miles to work; from work he rides his bike 4 miles east to his grandmothers house. What is his total displacement and total distance?

Carolyn walks her dog 3 miles in a straight line, then turns 90O and continues another 1.5 miles to the dog park. What is the total distance and displacement to the dog park?

|  |  |
| --- | --- |
| Speed |  |
| Average Speed |  |
| Instantaneous Speed |  |

A person jogs 4.0 km in 32 minutes, then 2.0 km in 22 minutes, and finally 1.0 km in 16 minutes. Calculate the jogger’s average speed in the units km/min.

A train travels 190 km in 3.0 hours, and then 120 km in 2.0 hours. What is the train’s average speed in the units km/hour?

GRAPHING:

On a graph that shows distance vs time, the slope is \_\_\_\_\_\_\_\_\_\_\_\_

Velocity:

Velocity and Vectors

A boat is traveling down a river at 15 km/hr. The river is flowing at a rate of 6 km/hr. What is the velocity of the boat relative to the river?

A boat is traveling north on a river at 20 km/hr. The river is flowing east at a rate of 4 km/hr. What is the resultant velocity of the boat?

|  |  |
| --- | --- |
| Acceleration |  |
| Instantaneous Acceleration |  |
| Constant Acceleration |  |

Free fall:

A stone is dropped and free falls for 4 seconds, what is the change in velocity of the stone?

A car traveling at 10 m/s starts to decelerate steadily. It comes to a complete stop in 20 seconds. What is its acceleration?

An airplane travels down a runway for 4.0 seconds with an acceleration of 9.0 m/s2. What is its change in velocity during this time?

A ball rolls down a ramp starting from rest. After 2 seconds its velocity is 6 meters per second. What is the acceleration of the ball?

A child drops a ball from a bridge. The ball strikes the water under the bridge 2.0 seconds later. What is the velocity of the ball when it strikes the water? (Remember you will need the